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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/896,681	06/29/2001	Vladislav Vashchenko	75292/12849	8699

7590

07/19/2002

Jurgen K. Vollrath
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EXAMINER

NGUYEN, JOSEPH H

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 07/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/896,681

Applicant(s)

VASHCHENKO ET AL.

Examiner

Joseph Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 11-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of claims 1-4 and 11 in Paper No. 3 is acknowledged. The traversal is on the ground(s) that the term "splitting the n+ drain region" does not intend to suggest that there is a physical forming of single region that is sequentially split". This is not found persuasive because this is a method claim and it should include the physical forming of a so-called single region. Furthermore, there are indeed the generic claims in the present application. Therefore, claims 1-7, 11-16 are now rejoined for prosecution whereas claims 8-10 are withdrawn from consideration.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "drain contacts" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The term "a two stage snapback" is not clearly and concisely defined in the specification in such a way one having ordinary skill in the art can make and use.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-5 and 11-12, 14-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the p+ emitter region" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation "the p+ emitter and n+ drain regions" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "the drain region" and "at least part of the drain contact region" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation "the n + drain region" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the drain region" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the n+ drain region" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claims 14 and 15 recite the limitation "the emitter" in line 1. There is insufficient antecedent basis for this limitation in the claims.

Claims 6-7 and 13 are also rejected due to their dependency upon the rejected base claims above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-2, 4-7 and 11-15 are rejected under 35 U.S.C. 102(b) as being anticipated by figure 2 of the acknowledged prior art (APA).

Regarding claim 1, as best the examiner is able to ascertain to examine the claimed invention, figure 2 of (APA) discloses a LVTSCR like ESD protection structure

wherein the structure displays a two-stage snapback triggering characteristics. Note that any LVTSCR like ESD protection structure has the characteristics of a two-stage snapback triggering in a broad sense.

Regarding claim 2, as best the examiner is able to ascertain to examine the claimed invention, the claim limitation is merely the functional language and therefore not given patentable weight.

Regarding claim 4, figure 2 of (APA) discloses the emitter 124 is located outside the drain region 230 of the structure so that at least part of the drain contact region lies between the gate 236 and the emitter region 124.

Regarding claim 5, figure 2 of (APA) discloses the n⁺ drain region 230 is split into at least one first drain region locate bear the gate 236, and at least one second drain region.

Regarding claim 6, figure 2 of (APA) discloses the at least one first drain region comprises a floating n⁺ region, and the at least one second drain region comprises an n⁺ contact region.

Regarding claim 7, figure 2 of (APA) discloses multiple emitters outside at least part of the n⁺ drain region.

Regarding claim 11, figure 2 of (APA) discloses a high holding voltage LVYSCR like structure comprising an emitter located so that at least part of the drain region is located between the gate 236 and emitter region 124.

Regarding claim 12, figure 2 of (APA) discloses the n+ drain region 230 is split into at least one first drain region located near the gate 236, and at least one second drain region.

Regarding claim 13, figure 2 of (APA) discloses the at least one first drain region comprises a floating n+ region and the at least one second drain region comprises an n+ contact region.

Regarding claims 14 and 15, figure 2 of (APA) discloses the emitter comprises a plurality of emitter region.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over (APA) as applied to claim 1 above, and further in view of Lee et al.

Regarding claim 3, (APA) discloses substantially all the structure set forth in the claimed invention except the location of p+ emitter and n+ drain regions are reversed. However, Lee et al discloses on figure 10 the location of the p+ emitter 101 and n+ drain region 102 are reversed. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify (APA) by having the location of p+ emitter and n+ drain regions being reversed for the purpose of

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providing low voltage triggering of the parasitic SCR as taught by Lee et al (col. 3, lines 15-16).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over (APA) as applied to claim 11 above, and further in view of Voldman.

Regarding claim 16, (APA) discloses substantially all the structure set forth in the claimed invention except the first and second drain region being separated by a shallow trench isolation region. However, Voldman discloses on figure 4 the first and second drain regions being separated by shallow trench isolation regions. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify (APA) by having the first and second drain region being separated by a shallow trench isolation region for the purpose of effectively preventing the leakage current in the semiconductor device.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 5932916 to Jung discloses the ESD protection circuit.

US Patent 6355959 B1 to Vashchenko et al disclose the ESD protection circuit.

US Patent 6281527 B1 to Chen disclose an ESD protection circuit.

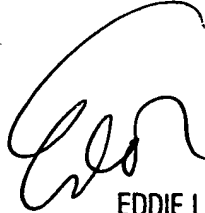
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 308-7382 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JN
July 8, 2002



EDDIE LEE
SUPERVISORY PATENT EXAMINER
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